

COMPOSITE PRODUCTS,  
METHODS AND APPARATUS

ABSTRACT OF THE DISCLOSURE

5       A low-stretch, flexible composite, made of one or  
several sections, particularly useful for making a sail (2),  
includes first and second polymer films (52, 62) with  
discontinuous, stretch-resistant segments (16) therebetween.  
The segments extend generally along the load lines (17) for  
10      the sail. The segments have lengths which are substantially  
shorter than corresponding lengths of the load lines within  
each section. The ends of the segments are laterally  
15      staggered relative to one another. Mats (20) of generally  
parallel mat elements can be used as the segments. The mat  
elements typically include discrete multifiber yarns (24, 26)  
and/or a fiber array (22), typically created by pneumatically  
laterally spreading apart the fibers of an untwisted  
multifiber yarn (32). A laminating assembly includes first  
and second flexible pressure sheets (66, 68), defining a  
sealable lamination interior (82) containing the material  
stack (64) to be laminated, housed within an enclosure (90).  
A partial vacuum is created within the lamination interior and  
heated fluid is circulated in contact with the pressure sheets  
25      to quickly and uniformly heat the pressure sheets and the  
material stack being laminated.